

Polychlorinated Biphenyls (PCBs)

Roanoke (Staunton) River Watershed

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What Are PCBs?

- PCBs consist of a Biphenyl molecule with a specific number of chlorine atoms (1-10)

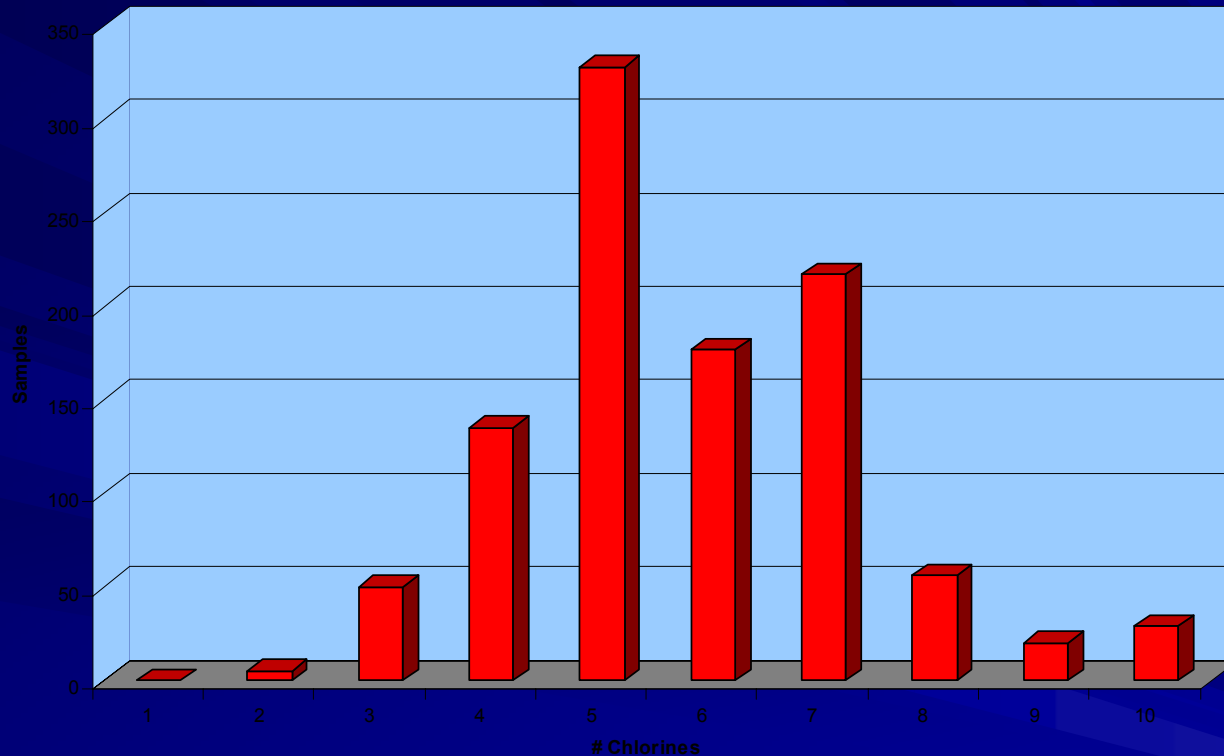


- 209 distinct PCB Compounds
- Aroclor – mixture of PCB Compounds

Polychlorinated Biphenyls (PCBs)

- PCBs with 1-2 chlorine atoms
 - More soluble
 - Off gas to the atmosphere
 - Biologically degrade
- PCBs with 5 – 7 chlorines atoms are the most common
 - Less soluble/bind to particles
 - Less susceptible to biodegradation

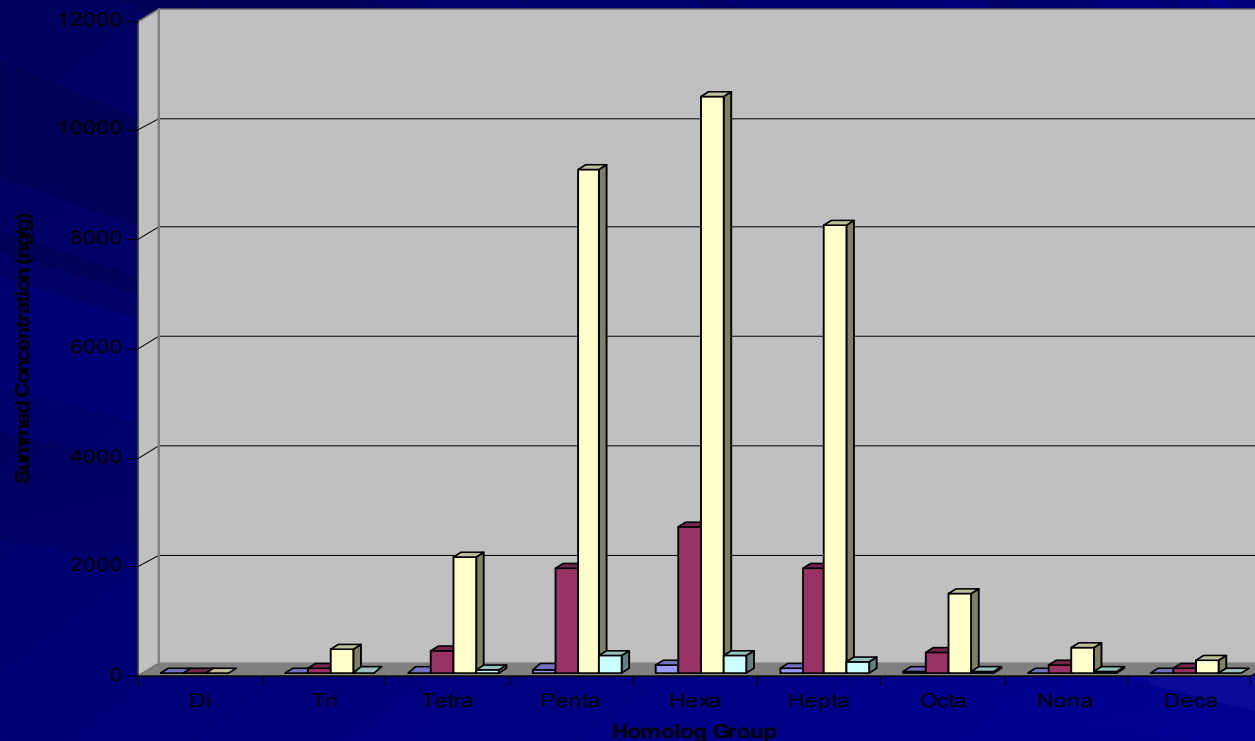
Polychlorinated Biphenyls (PCBs)



- The more chlorine atoms a PCB molecule has, the longer it stays in the environment

Polychlorinated Biphenyls (PCBs)

Distribution of PCB Homologs in Fish tissue collected at 111 stations below the fall-line



- PCBs Accumulate in fatty tissue
 - Especially PCBs with 5-7 chlorine atoms



Historical PCB Use

- Estimated that > 1.5 Billion lbs. manufactured in the U.S. until 1977
- Very stable and heat resistant
- Uses Include:
 - Transformers, capacitors, hydraulic fluids, circuit breakers, PVC Products, carbonless copy paper, caulking material, etc.



How do PCBs get into Rivers?

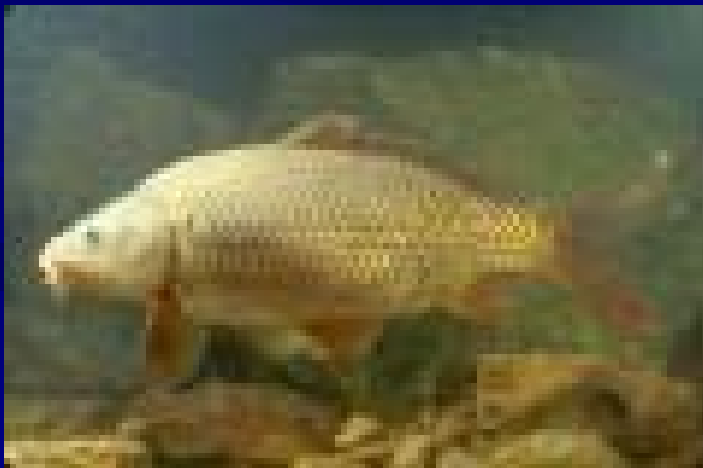


- PCBs Banned in 1979
 - Believed to be legacy issue
- Still used for many years
- Direct and Indirect Sources
 - Industry/Municipal
 - Storm runoff

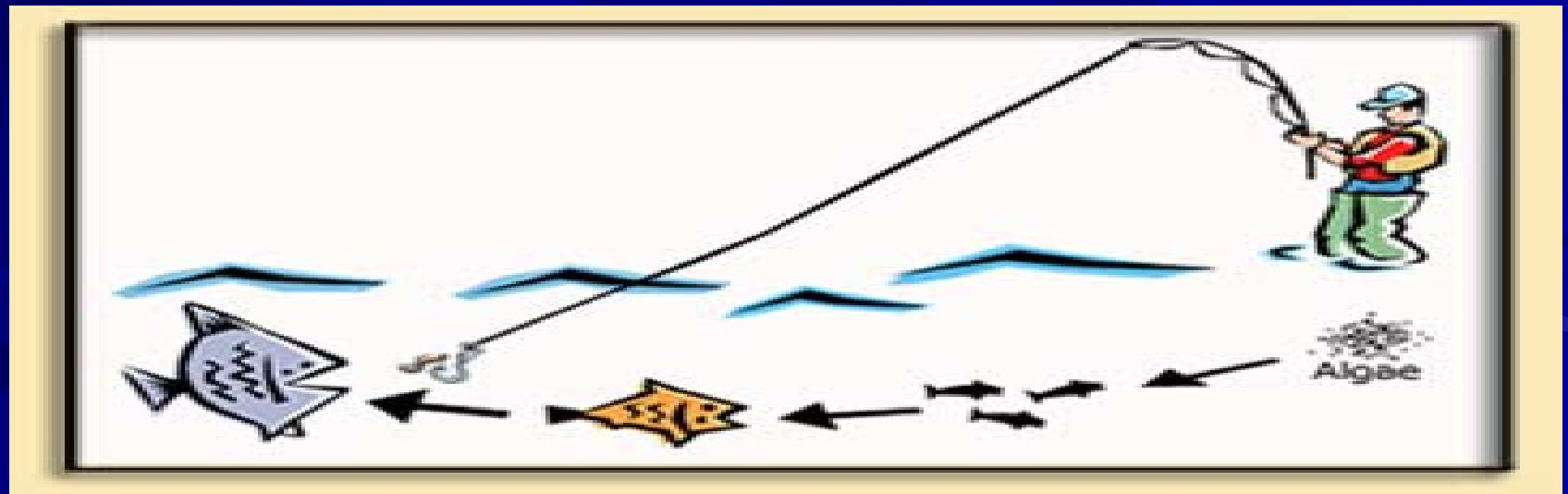


PCB Exposure to Aquatic Life

- Direct contact with bottom sediment (muck)
 - Benthic community (bugs) & fish
- Ingest contaminated particles or bugs
 - Shellfish and fish
- Large fish eat smaller contaminated fish

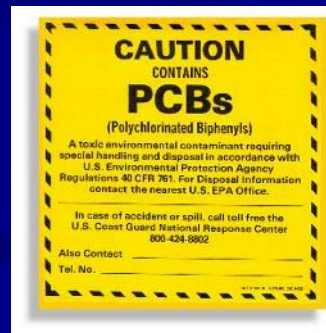


PCB Exposure to Wildlife and Humans

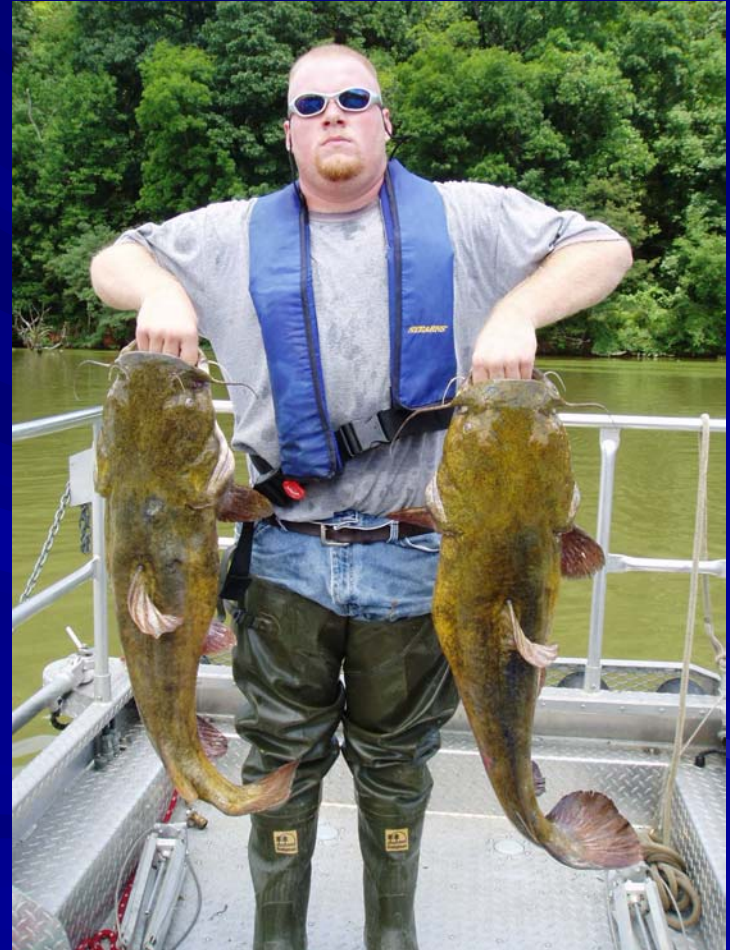


PCB Health Risks

- Probable Carcinogen
- May be associated with developmental effects in children
- Accumulates in fatty tissue



All Waters are Supposed to Provide for Fish That are Safe to Eat



DEQ Fish Tissue Monitoring

- Fish Tissue Monitoring Program is designed to Help Assess the “Fishable” Goal of the Clean Water Act



A scenic photograph of a sunset over a body of water. The sky is filled with horizontal bands of pink, orange, and yellow, with the sun low on the horizon. The water in the foreground is dark blue with small, shimmering reflections of the sunset colors. In the background, dark silhouettes of hills or mountains are visible against the bright sky.

Questions?